

1.5

SPLIT

DART AEROSPACE LTD	Work Order:	21829 B
Description: Float Assembly	Part Number:	D3218-041
Dwg: D3218 Rev. A	Qty:	6 12
D3218-041 replaces Helitech P/N: 358-008-001		Page 1 of 1

Step	Location	Procedure	By	Date	Qty
1	DC	Issue Traveler	PH	04.11.02	12
2	PG	Order bags in multiples of 3 Issue P/O: 2009076 Supplier: Tulmar Safety Systems D3218-041 Float Assembly per Dwg D3218 Serial No.: BXXXXX-01, BXXXXX-02, etc. Copy of inspection paperwork is required with each Float Assembly	U	04.11.03	12
3	RG	Receive and Inspect for transit damage Ensure inspection paperwork is provided with each Float Assembly	CL	05/01/12	6
4	QC5	Review vendor paperwork for completeness - Ensure all pressure tests passed - Ensure all dimensions within tolerance - Ensure Dart inspection performed - Ensure s/n printed on bag matches paperwork/Dart W/O Visually inspect bag for defects - No de-lamination or puckering of seams - Girt attachment OK - No holes through stitching - No excess glue - Valves installed in proper locations	PH	05.01.13	6
5	ST	Re-package and Stock in Kwik Float cell	CL	05/01/17	6
6	AC	Cost / part 2278.24	SAC	05/01/18	6
7	DC	Close W/O 2277.16 Inspect Level 21	PH	05.01.24	6

Rev	Date	Change	Revised By	Approved
A	03.11.14	New issue	KJ/DS	PH

RELEASED

03.11.19 PH



DESIGN #	DRAWN BY #	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED #	APPROVED #	DRAWING NO. D3218	REV. A SHEET 1 OF 2
DATE 03.10.06		TITLE FLOAT ASSEMBLY	SCALE NTS
A	03.10.06	NEW ISSUE	

RELEASED

03.12.05

**D3218-041 FLOAT ASSEMBLY, NOTES:**

1) MATERIAL:

ITEM	DESCRIPTION	QTY
FABRIC	POLYURETHANE COATED, PENNEL 987-123 YELLOW	7.20 m
ADHESIVE	SEALREZ S-0345 A/B	2.50 L
WEBBING	LAGRAN #3003, 1" WHITE NYLON	0.31 m
THREAD	NYLON, TWISTED TYPE II, SIZE F, CLASS A, V-T-295, COLOR TAN, CSB 92, COLOR #53	5.00 yds
NYLON CORD	MIL-C-5040 TYPE III, COLOR NATURAL	1.60 m
LETTERING	COATES SCREEN C99 S170 BLACK, HIGH GLOSS	0.50 oz
INFLATION VALVE	MIRADA B-51016 / A-51265	2
PRESSURE RELIEF VALVE	MIRADA B-51019	2
TOPPING VALVE	MIRADA B-51209	2
FLANGE	MIRADA B-51014-N (4.25")	4
FLANGE	HALKEY ROBERTS 981001020 (3.5")	2

2) AFTER MANUFACTURE:

- PRESSURE TEST EACH CHAMBER TO 4.36 PSI (30 kPa) FOR 5 MINS.
- INFLATE TO RELIEF VALVE PRESSURE [MIN OF 3.00 PSI (20.6 kPa)].  
RELIEF VALVE MUST OPEN AT 3.3-3.5 PSI AND MUST CLOSE AT NOT LESS THAN 3.00 PSI. BAG MUST MAINTAIN A MIN PRESSURE OF 1.6 PSI (11.0 kPa) FOR 24 HOURS.

3) FLOAT IDENTIFICATION LETTERING 0.313" (7.95mm) HIGH BLACK CAPITAL LETTERS STENCILED ON THE R/H SIDE OF THE FLOAT BAG AS FOLLOWS:

**DART AEROSPACE LTD.**

**FLOAT ASSEMBLY**

**P/N D3218-041**

**S/N BXXXXX-XX**

**REPLACES HELITECH P/N 358-008-001**

- COATED SIDE OF FABRIC ON OUTSIDE OF BAG.
- ALL DIMENSIONS ARE IN INCHES. CRITICAL DIMENSIONS (DENOTED BY  $\triangle$ ) MUST BE OBTAINED AT 2 PSI.
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

SHOP COPY

RETURN TO  
ENGINEERING

UNCONTROLLED CC

SUBJECT TO A/E/ENDM  
WITHOUT NOTICE

WORK ORDER

NO. 21829

Copyright © 2003 by DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.



# PACKING SLIP

COPY

**TULMAR**

**Tulmar Safety Systems Inc.**

1123 Cameron Street  
Hawkesbury, ON K6A 2B8 CA  
Tel: 613-632-1282  
Fax: 613-632-2030  
www.tulmar.com  
email: info@tulmar.com

**Packing Slip No**

**18096**

**Ship Date**

11-Jan-05

Bill No:

**Dart Aerospace**

1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7. Canada

Ship To:

**Dart Aerospace**

1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7. Canada

Order number	Sales order date	Account number	Account manager
14700	5-Nov-04	CDART100	Barney Bangs
PO number	Ship Via	PPD/COL	
2007076	Pick-Up		
Item No.	Quantity ordered	UOM	Qty Shipped/Returned
Description			Quantity on back order

R92-10174

8927

Float Assembly, individual bag/P/N: D3218-041

6

EA

6

Drawing No: D3218

P/N: BHA/RDA/358-11-01,Rev NR

P/N :D3218-041

Revision A

Must use Sealrez S-0345A/B adhesive.

S/N: B21829-01 to -12

<b>Lot No:</b>	B21829-00000007	Qty:	1	<b>Lot No:</b>	B21829-00000008	Qty:	1	<b>Lot No:</b>	B21829-00000009	Qty:	1
<b>Lot No:</b>	B21829-00000010	Qty:	1	<b>Lot No:</b>	B21829-00000011	Qty:	1	<b>Lot No:</b>	B21829-00000012	Qty:	1

*4/2/05*

# Sales Order Acknowledgement

**TULMAR**

Tulmar Safety Systems Inc.

1123 Cameron Street  
Hawkesbury, ON K6A 2B8 CA

Tel: 613-632-1282  
Fax: 613-632-2030

Order No 14700 Order Date 5-Nov-04 Page 1

Customer Purchase Order  
2007076

Contact:

## Bill To

Dart Aerospace  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
CA

## Ship To

Dart Aerospace  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
CA

Dear Customer,

This document acknowledges receipt of your order. Please review the information presented here and advise us of any errors you notice or disagreements you have at your earliest convenience. For fastest service, write or call us at the address and phone number printed above. Please refer to our Order Number and your P.O. Number in all correspondence.

<b>Customer</b>	<b>Payment Terms</b>	<b>PPD/COL</b>	<b>Shipping Instructions</b>
CDART100	Net 30 Days Pick-Up Ship Date		FOB HAWKESBURY

Item No	Quantity	UOM	Unit Price	Extended Price
8927 Float Assembly, individual bag P/N: D3218-041 P/N .D3218-041 Revision A Must use Sealrez S-0345A/B adhesive.	12	EA		
11-Dec-04	- 6	Dec. 31/04	S/N: 21829 - 01	- 02
	6			- 03
				- 04
				- 05
				- 06

4/01 B21829 - 01 to -12

added Dec. 23.04 SBC

3664

- 6 Jan 11/05 S/N: 21829 - 07  
- 08  
- 09  
- 10  
- 11  
- 12

Sales amount

Sales tax:

Total

## Release Note

**TULMAR SAFETY SYSTEMS INC.**

1123 Cameron Street,

Hawkesbury, Ont. Canada K6A 2B8

Tel: (613)632-1282

Fax: (613)632-2030

Revision 05/08/01 Form 458

R/N No.

R92-10174

Date:

1/11/2005

**Sold To:**

**Shipped To:**

DART AEROSPACE LTD

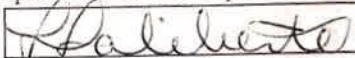
1270 Aberdeen Street

Hawkesbury, ON K6A 1K7

Your Order		Conveyance	Our Order No.		P/S No.
2007076		Pick Up	14700		18096

Item	Description	Qty Ordered	Spec'n No.	Qty Shipped	Incoming Release No.	Batch
1.	FLOAT ASSY, Individual Bag	6	TSS8927	6		
	P/N: .D3218-041	0				
	S/N: B21829-07 thru -012	0				
	DOM: 01/2005	0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				
		0				

I hereby certify that the items listed hereon have been inspected, tested, and conform to all specifications and requirements detailed in the contract or purchase order.



Authorized Inspector

1/11/2005

Date



**TULMAR****Product Inspection Form # 193-8927(Tube & Final)**

Rev. D Sheet 1 of 3

**Description: Float Bag Assembly**

-Items are Manufactured IAW Process Control Specification No. 001, 002, 003, 004, 005, 006, and are to be 100% inspected I.A.W. P.I.P. 001


W/O: 3664 TSS P/N: 8927 Qty.: 12 Customer P/N: D3218-041 Dwg. No.: D3218 Rev.: A Date: \_\_\_\_\_

Cutting IAW PCS 003		Marking IAW PCS 004		Bonding IAW PCS 002		Silkscreen	
Operator No.	Date	Operator No.	Date	Operator No.	Date	Operator No.	Date
<u>85</u>	<u>Nov. 30/04</u>	<u>73</u>	<u>Dec 01/04</u>	( Documented below )		<u>73</u>	<u>Nov. 15/04</u>
						<u>73</u>	<u>Dec 15/04</u>

\* Note: PCS 006, there shall be a total of 2 samples submitted for the Testing of the Adhesive (Peel and Shear Test), at start and end of every production day, record on sheet 3/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. S	Date
1- a) Attach Panel A (uneven edge) to larger edge of Panel B, centered on a 2" inner tape (butt joint) $\pm 1/8"$ b) Attach (6) Valve Flanges on Panel A: 2-Relief, 2-Inlet & 2- Topping Up c) Attach (6) Doublers on above Flanges	<u>37</u> <u>1<sup>st</sup> dec. 04</u> <u>37</u> <u>1 dec. 04</u> <u>37</u> <u>1 dec. 04</u>	<u>7104-25</u>  <b>Bonding</b>	<u>1</u> <u>6</u> <u>6</u>	<u>—</u> <u>—</u> <u>—</u>	<u>—</u> <u>—</u> <u>—</u>	<u>1</u> <u>6</u> <u>6</u>	<u>11</u> <u>15</u> <u>17</u>	<u>Dec 2/04</u> <u>Dec 1/04</u> <u>Dec 1/04</u>
2- a) Attach Panel C to Straight edge of Panel A, centered on a 2" inner Tape (butt joint) $\pm 1/8"$	<u>37</u> <u>2 dec. 04</u>	<b>Bonding</b>	<u>1</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>11</u>	<u>Dec 2/04</u>
3- a) Att. Panel D to Panel B (shorter edge) with 2" inner Tape	<u>37</u> <u>2 dec. 04</u>		<u>1</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>15</u>	<u>Dec 2/04</u>
4- a) Baffle Ass'y. with 2" Tape $\pm 1/8"$	<u>117</u> <u>2 dec 04</u>		<u>1</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>11</u>	<u>Dec 2/04</u>
5- a) Attach Baffle Ass'y. to Bag ( in 3 stages, minimum )	<u>117</u> <u>3 dec 04</u>	<b>Bonding</b>	<u>1</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>15</u>	<u>Dec 3/04</u>
6- a) Perform Baffle Test on Chamber # 1 after a 3 day Cure Time	<u>12</u> <u>Dec 9 2004</u>	<b>Testing</b> (see sheet 2)	<u>1</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>4</u>	<u>Dec 9/04</u>
7- a) Closure of 1" Main Seam (overlap) $\pm 1/8"$ b) Attach ID Patch (ref. CAR 04-003)	<u>37</u> <u>13 dec. 04</u> <u>117</u> <u>22 dec 2004</u>	<u>7104-26</u> <b>Bonding</b>	<u>1</u> <u>1</u>	<u>—</u> <u>—</u>	<u>—</u> <u>—</u>	<u>1</u> <u>1</u>	<u>15</u> <u>15</u>	<u>Dec 13/04</u> <u>Dec 23/04</u>
8- a) Perform Baffle Test on Chamber # 2 after a 3 day Cure Time	<u>12</u> <u>Dec 16 2004</u>	<b>Testing</b> (see sheet 2)	<u>1</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>4</u>	<u>Dec 16 2004</u>
9- a) Attach 1" wide Finishing Tape on all Butt Joints & Main Seam, Centered $\pm 1/8"$ b) Att. Inspected Girt Ass'y. (Form 193-8927, Girt) to Bag c) Attach 5" split patch on each end ( x 4 )	<u>117</u> <u>Dec 21 2004</u> <u>117</u> <u>21 dec 2004</u> <u>117</u> <u>21 dec 2004</u>	<b>Bonding</b>	<u>1</u> <u>1</u> <u>1</u>	<u>—</u> <u>—</u> <u>—</u>	<u>—</u> <u>—</u> <u>—</u>	<u>1</u> <u>1</u> <u>1</u>	<u>11</u> <u>15</u> <u>15</u>	<u>Dec 23/04</u> <u>Dec 23/04</u> <u>Dec 23/04</u>



Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
10- a) Final Test b) Inspector to Stamp on ID Patch: Serial No.: B <b>21829-07</b> & Inspection Stamp beside the S/N	12 Jan 5/05  12 Jan 5/05	Testing (see sheet 3)	1  1	—  —	—  —	1  1		Jan 5/05  Jan 5/05
Upon completion of the (final) leakage test, the ID Patch shall be stamped with 5/16" high lettering and black ink: serial number (7 digits), provided by DART (refer to W/O). Verify the integrity of the Valves (Threads/gaskets).								

**Test Conditions** – All tests shall be performed in the following conditions:

a) Atmospheric pressure between 28 to 32 inches of mercury (94.8 kPa to 108.4 kPa) b) Temperature shall be 20°C ± 5°C c) Relative humidity shall be 80 % or less

### Baffle Test:

**Over Pressure:** Using socket tool and torque wrench s/n 0801300327, tight all (3) Valves to 40 inch pound, the JIC adaptor s/n 44537 between 15 to 20 foot pounds. Block the Relief valve with flagged pin. Inflate Chamber to 4.36 PSI (30 kPa) with clean dry air source. Using leak detector or non detergent soap, check all the valves and seams to detect leakage. Leakage shall be cause for rejection (soap during testing period). Fuzz is not considered a failure. After 5 minutes, there shall be no evidence of distortion or damage to the seams.

**Inflation Test:** Lower Chamber to 3.00 psi, re-adjust after 45 minutes. After 1 hour, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period. The corrected pressure reading shall not be less than 2.94 PSI in order for the Test to be acceptable.

- 0.054 PSI for each 1°C of temperature increase

+ 0.054 PSI for each 1°C of temperature decrease

+ 0.049 PSI for each 0.1 inch of barometric increase

- 0.049 PSI for each 0.1 inch of barometric decrease

Chambers	Pressure	5 Min. Over P. & Soap Test	45 Minute Stabilizing Period			1 Hour Test									132 humidity
		Pass / Fail	Design Pressure	Time On	Time Off	Design Pressure	Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass / Fail	
Dec 9/04															
# 1 (see note 1)	4.36 PSI	Pass	3.00 PSI	8:00	8:45	3.00 PSI	9:00	10:00	3.00 PSI	22° 22'	30.03 30.05	— +0.009	3.00 PSI	Pass	
Re-Test															
Dec 16/2004 Main Seam)	4.36 PSI	Pass	3.00 PSI	11:00	11:45	3.00 PSI	11:45	12:45	2.99 PSI	23° 23'	29.87 29.84	— 0.014	2.97 PSI	Pass	
Re-Test															

**Note 1:** Chamber # 1 requires Dart Aerospace Approval Signature:

*Chris Proven*

Date: 01.12.10

Observations: OK



**Final Test: Leakage / Relief Valves:** The chambers are to be tested separately (one at a time). Through the Topping Up Valve, inflate chamber to approximately 2.00 PSI, soap the (3) valves to detect leakage. Then slowly inflate chamber until pressure relief valve vents. Use leak detector or non detergent soap to detect the opening and the closing. A hissing sound may also denote that the valve has started to open. Record the opening/closing time and pressure. The opening pressure shall be between 3.3 – 3.5 PSI and the closing pressure shall not be less than 3.00 PSI, in order for the test to be acceptable. After 24 hours, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period (see sheet 2).

The corrected pressure reading shall not be less than 1.60 PSI in order for the Test to be acceptable.

Upon completion of the Final Test, inflate both chambers equally to approx. 2.00 PSI and perform Dimensional Verification below. Perform additional inspection of the tapes and girt assembly.

Pressure Relief Valve Test	PRV Serial Numbers	Opening		Closing		Pass / Fail
		Time ON	Pressure	Time	Close	
Chamber # 1	33201	11:30	3.45 PSI	11:35	3.19 PSI	Pass
Chamber # 2 (Main Seam)	33205	11:55	3.33 PSI	12:00	3.06 PSI	Pass

Chambers	Design (closing) Pressure as per above	24 Hour Leakage Test								Humidity: 12 %	
		Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass	Fail	
Jan 3/05 # 1	3.19 PSI	11:35	11:35	2.41 PSI	24 <sup>c</sup> 24 <sup>c</sup>	30.09 30.10	<div>— +0.004</div>	2.42 PSI	Pass		
Re-Test											
Jan 5/05 (Main Seam)	3.06 PSI	12:00	12:00	2.03 PSI	21 <sup>c</sup> 23	30.09 30.18	<div>+0.108 +0.044</div>	1.96 PSI	Pass		
Re-Test											

Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail
3.5	± 0.100 *	3.25	Pass	47.0	± 0.5	46 3/4	Pass	24.75	± 0.5	25	Pass
7.3	± 0.100 *	7.4	Pass					31.0	± 0.5	31 1/16	Pass

\* = IAW QSI 018, rev. A dated 03-05-29

4

### Submission of Adhesive Testing:

		Subm. Date / am/pm	Pass/Fail	Subm. Date / am/pm	Pass/Fail	Subm. Date / am/pm	Pass/Fail	Subm. Date / am/pm	Pass/Fail
Peel	24 hour	Dec 1/04	Pass	Dec 1/04	Pass	Dec 3/04	Pass	Dec 13/04	Pass
	7 day	Dec 1/04	Pass	Dec 1/04	Pass	Dec 3/04	Pass	Dec 13/04	Pass
Shear	24 hour	Dec 1/04	Pass	Dec 1/04	Pass	Dec 3/04	Pass	Dec 13/04	Pass
	7 day	Dec 1/04	Pass	Dec 1/04	Pass	Dec 3/04	Pass	Dec 13/04	Pass



# TULMAR

#7

## Product Inspection Form # 193-8927(Tube & Final)

Rev. D Sheet 13

Description: Float Bag Assembly

-Items are Manufactured IAW Process Control Specification No. 001, 002, 003, 004, 005, 006, and are to be 100% inspected I.A.W. P.I.P. 001

W/O: 3664 TSS P/N: 8927 Qty.: 1 Customer P/N: D3218-041 Dwg. No.: D3218 Rev.: A Date: \_\_\_\_\_

Cutting IAW PCS 003		Marking IAW PCS 004		Bonding IAW PCS 002		Silkscreen	
Operator No.	Date	Operator No.	Date	Operator No.	Date	Operator No.	Date
<u>85</u>	<u>Nov. 30/04</u>	<u>73</u>	<u>Dec 01/04</u>	( Documented below )		<u>73</u>	<u>Nov. 15/04</u>
						<u>73</u>	<u>Dec 15/04</u>

\* Note: PCS 006, there shall be a total of 2 samples submitted for the Testing of the Adhesive (Peel and Shear Test), at start and end of every production day, record on sheet 3/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
1- a) Attach Panel A (uneven edge) to larger edge of Panel B, centered on a 2" inner tape (butt joint) $\pm 1/8"$ b) Attach (6) Valve Flanges on Panel A: 2-Relief, 2-Inlet & 2- Topping Up c) Attach (6) Doublers on above Flanges	<u>37</u> <u>8dec.04</u> <u>4110</u> <u>6/12/04</u>	<u>7104-26</u>  <b>Bonding</b>	<u>1</u> <u>660</u> <u>6</u>	<u>-</u> <u>-6</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>1</u> <u>660</u> <u>6</u>	<u>11</u> <u>11</u> <u>11</u>	<u>Dec 9/04</u> <u>Dec 7/04</u> <u>Dec 7/04</u>
2- a) Attach Panel C to Straight edge of Panel A, centered on a 2" inner Tape (butt joint) $\pm 1/8"$	<u>37</u> <u>9dec.04</u>	<u>7104-26</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>11</u>	<u>Dec 9/04</u>
3- a) Att. Panel D to Panel B (shorter edge) with 2" inner Tape	<u>37</u> <u>9dec.04</u>	<u>7104-26</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>11</u>	<u>Dec 9/04</u>
4- a) Baffle Ass'y. with 2" Tape $\pm 1/8"$	<u>47</u> <u>9dec04</u>	<b>Bonding</b>	<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>11</u>	<u>Dec 9/04</u>
5- a) Attach Baffle Ass'y. to Bag ( in 3 stages, minimum )	<u>117</u> <u>10dec 04</u>		<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>11</u>	<u>Dec 10/04</u>
6- a) Perform Baffle Test on Chamber # 1 after a 3 day Cure Time	<u>12</u> <u>Dec 14 2004</u>	<b>Testing</b> (see sheet 2)	<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>4</u>	<u>Dec 14/04</u>
7- a) Closure of 1" Main Seam (overlap) $\pm 1/8"$ b) Attach ID Patch (ref. CAR 04-003)	<u>117</u> <u>15dec04</u> <u>117</u> <u>22dec04</u>	<b>Bonding</b>	<u>1</u> <u>1</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>1</u> <u>1</u>	<u>11</u> <u>11</u>	<u>Dec 16/04</u> <u>Dec 22/04</u>
8- a) Perform Baffle Test on Chamber # 2 after a 3 day Cure Time	<u>12</u> <u>Dec 21/04</u>	<b>Testing</b> (see sheet 2)	<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>4</u>	<u>Dec 21/04</u>
9- a) Attach 1" wide Finishing Tape on all Butt Joints & Main Seam, Centered $\pm 1/8"$ b) Att. Inspected Girt Ass'y. (Form 193-8927, Girt) to Bag c) Attach 5" split patch on each end ( x 4 )	<u>117</u> <u>22dec04</u> <u>117</u> <u>22dec04</u> <u>117</u> <u>22dec04</u>	<b>Bonding</b>	<u>1</u> <u>1</u> <u>1</u>	<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>1</u> <u>1</u> <u>1</u>	<u>11</u> <u>11</u> <u>11</u>	<u>Dec 22/04</u> <u>Dec 22/04</u> <u>Dec 22/04</u>





**TULMAR**

#7

**Product Inspection Form # 193-8927(Tube & Final)**

Rev. D Sheet 2/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
10- a) Final Test b) Inspector to Stamp on ID Patch: Serial No.: B <b>21829-08</b> & Inspection Stamp beside the S/N	12 Jan 5/05  12 Jan 5/05	Testing (see sheet 3)	1  1	—  —	—  —	1  1	 	Jan 5/2005  Jan 5/2005
Upon completion of the (final) leakage test, the ID Patch shall be stamped with 5/16 " high lettering and black ink: serial number (7 digits), provided by DART (refer to W/O). * Verify the integrity of the Valves (Threads/gaskets).								

**Test Conditions** – All tests shall be performed in the following conditions:

a) Atmospheric pressure between 28 to 32 inches of mercury (94.8 kPa to 108.4 kPa) b) Temperature shall be 20°C ± 5°C c) Relative humidity shall be 80 % or less

**Baffle Test:**

**Over Pressure:** Using socket tool and torque wrench s/n 0801300327, tight all (3) Valves to 40 inch pound, the JIC adaptor s/n 44537 between 15 to 20 foot pounds. Block the Relief valve with flagged pin. Inflate Chamber to 4.36 PSI (30 kPa) with clean dry air source. Using leak detector or non detergent soap, check all the valves and seams to detect leakage. Leakage shall be cause for rejection (soap during testing period). Fuzz is not considered a failure. After 5 minutes, there shall be no evidence of distortion or damage to the seams.

**Inflation Test:** Lower Chamber to 3.00 psi, re-adjust after 45 minutes. After 1 hour, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period. The corrected pressure reading shall not be less than 2.94 PSI in order for the Test to be acceptable.

- 0.054 PSI for each 1°C of temperature increase

+ 0.054 PSI for each 1°C of temperature decrease

+ 0.049 PSI for each 0.1 inch of barometric increase

- 0.049 PSI for each 0.1 inch of barometric decrease

Chambers	Pressure	5 Min. Over P. & Soap Test	45 Minute Stabilizing Period			1 Hour Test								
		Pass / Fail	Design Pressure	Time On	Time Off	Design Pressure	Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass / Fail
Dec 17/04 #1 (see note 1)	4.36 PSI	Pass	3.00 PSI	8:30	9:15	3.00 PSI	9:15	10:15	3.03 PSI	23° 23°	29.92 29.91	-0.004	2.99 PSI	Pass
Re-Test														
Dec 21/04 #2 Main Seam)	4.36 PSI	Pass	3.00 PSI	1:45	2:30	3.00 PSI	2:30	3:30	PSI	23° 23°	29.80 29.77	-0.014	2.95 PSI	Pass
Re-Test														

Note 1: Chamber # 1 requires Dart Aerospace Approval Signature: Chris ProvencherDate: 04.12.15Observations: OK



**Final Test: Leakage / Relief Valves:** The chambers are to be tested separately (one at a time). Through the Topping Up Valve, inflate chamber to approximately 2.00 PSI, soap the (3) valves to detect leakage. Then slowly inflate chamber until pressure relief valve vents. Use leak detector or non detergent soap to detect the opening and the closing. A hissing sound may also denote that the valve has started to open. Record the opening/closing time and pressure. The opening pressure shall be between 3.3 - 3.5 PSI and the closing pressure shall not be less than 3.00 PSI, in order for the test to be acceptable. After 24 hours, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period (see sheet 2).

The corrected pressure reading shall not be less than 1.60 PSI in order for the Test to be acceptable.

Upon completion of the Final Test, inflate both chambers equally to approx. 2.00 PSI and perform Dimensional Verification below. Perform additional inspection of the tapes and girt assembly.

Pressure Relief Valve Test	PRV Serial Numbers	Opening		Closing		Pass / Fail
		Time ON	Pressure	Time	Close	
Chamber # 1	32868	11:50	3.40 PSI	11:55	3.19 PSI	Pass
Chamber # 2 (Main Seam)	31671	12:55	3.49 PSI	1:00	3.03 PSI	Pass

24 Hour Leakage Test	Design (closing) Pressure as per above	Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass / Fail
Chamber # 1	3.19 PSI	11:55	11:55	2.56 PSI	24° 24°	30.09 30.09	—	2.56 PSI	Pass
Re-Test									
Chamber # 2 (Main Seam)	3.03 PSI	1:00	1:00	2.15 PSI	21° 23	30.08 30.15	-0.108 +0.034	2.07 PSI	Pass
Re-Test									

Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail
3.5	± 0.100 *	3.5	Pass	47.0	± 0.5	46 3/4	Pass	24.75	± 0.5	25 1/4	Pass
7.3	± 0.100 *	7.3	Pass					31.0	± 0.5	31 1/8	Pass

\* = IAW QSI 018, rev. A dated 03-05-29

### Submission of Adhesive Testing:

		Subm. Date / am/pm	Pass/Fail	Subm. Date / am/pm	Pass/Fail	Subm. Date / am/pm	Pass/Fail	Subm. Date / am/pm	Pass/Fail
Peel	24 hour	Dec 2/04	Failed	Dec 9/04	Pass	Dec 22/04	Pass		
	7 day	Dec 2/04	Failed	Dec 9/04	Pass	Dec 22/04	Pass		
Shear	24 hour	Dec 2/04	Failed	Dec 9/04	Pass	Dec 22/04	Pass		
	7 day	Dec 2/04	Failed	Dec 19/04	Pass	Dec 22/04	Pass		

Note 1 Bag # 7 all work was taken apart & reworked



#9

Description: Float Bag Assembly

-Items are Manufactured IAW Process Control Specification No. 001, 002, 003, 004, 005, 006, and are to be 100% inspected I.A.W. P.I.P. 001

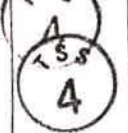
W/O: 3664 TSS P/N: 8927 Qty.: 12 Customer P/N: D3218-041 Dwg. No.: D3218 Rev.: A Date:

Cutting IAW PCS 003		Marking IAW PCS 004		Bonding IAW PCS 002		Silkscreen	
Operator No.	Date	Operator No.	Date	Operator No.	Date	Operator No.	Date
85	Nov. 30/04	73	Dec 01/04	( Documented below )		73	Nov. 15/04
						73	Dec 15/04

\* Note: PCS 006, there shall be a total of 2 samples submitted for the Testing of the Adhesive (Peel and Shear Test), at start and end of every production day, record on sheet 3/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
1- a) Attach Panel A (uneven edge) to larger edge of Panel B, centered on a 2" inner tape (butt joint) $\pm$ 1/8"	37 7dec.04	7104-26	1	-	-	1	100	Dec 8/04
b) Attach (6) Valve Flanges on Panel A: 2-Relief, 2-Inlet & 2- Topping Up	} #110 2/12/04	Bonding	6	-	-	6	100	Dec. 6/04
c) Attach (6) Doublers on above Flanges			6	-	-	6	100	Dec. 6/04
2- a) Attach Panel C to Straight edge of Panel A, centered on a 2" inner Tape (butt joint) $\pm$ 1/8"	37 8dec.04	7104-26	1	-	-	1	100	Dec 8/04
3- a) Att. Panel D to Panel B (shorter edge) with 2" inner Tape	37 8dec.04	7104-26	1	-	-	1	100	Dec 8/04
4- a) Baffle Ass'y. with 2" Tape $\pm$ 1/8"	117 9dec.04	Bonding	1	-	-	1	100	Dec 9/04
5- a) Attach Baffle Ass'y. to Bag (in 3 stages, minimum)	117 9dec.04		1	-	-	1	100	Dec 9/04
6- a) Perform Baffle Test on Chamber # 1 after a 3 day Cure Time	12 13dec 2004	Testing (see sheet 2)	1	-	-	1	100	Dec 13/04
7- a) Closure of 1" Main Seam (overlap) $\pm$ 1/8"	117 25dec.04	Bonding	1	-	-	1	100	Dec 15/04
b) Attach ID Patch (ref. CAR 04-003)	37 22dec.04		1	-	-	1	100	Dec 15/04
8- a) Perform Baffle Test on Chamber # 2 after a 3 day Cure Time	12 20dec 04	Testing (see sheet 2)	1	-	-	1	100	Dec 20/04
9- a) Attach 1" wide Finishing Tape on all Butt Joints & Main Seam, Centered $\pm$ 1/8"	37 21dec.04	7104-26	1	-	-	1	100	Dec 22/04
b) Att. Inspected Girt Ass'y. (Form 193-8927, Girt) to Bag	37 22dec.04	Bonding	1	-	-	1	100	Dec 23/04
c) Attach 5" split patch on each end ( x 4 )	37 22dec.04		1	-	-	1	100	Dec 23/04



Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
10- a) Final Test b) Inspector to Stamp on ID Patch: Serial No.: B <b>21829-09</b> & Inspection Stamp beside the S/N	12 Jan 5/05 12 Jan 5/05	Testing (see sheet 3)	1 1	— —	— —	1 1		Jan 5/2005 Jan 5/2005

Upon completion of the (final) leakage test, the ID Patch shall be stamped with 5/16 " high lettering and black ink; serial number (7 digits), provided by DART (refer to W/O). \* Verify the integrity of the Valves (Threads/gaskets).

**Test Conditions** – All tests shall be performed in the following conditions:

a) Atmospheric pressure between 28 to 32 inches of mercury (94.8 kPa to 108.4 kPa) b) Temperature shall be 20°C ± 5°C c) Relative humidity shall be 80 % or less

### Baffle Test:

**Over Pressure:** Using socket tool and torque wrench s/n 0801300327, tight all (3) Valves to 40 inch pound, the JIC adaptor s/n 44537 between 15 to 20 foot pounds. Block the Relief valve with flagged pin. Inflate Chamber to 4.36 PSI (30 kPa) with clean dry air source. Using leak detector or non detergent soap, check all the valves and seams to detect leakage. Leakage shall be cause for rejection (soap during testing period). Fuzz is not considered a failure. After 5 minutes, there shall be no evidence of distortion or damage to the seams.

**Inflation Test:** Lower Chamber to 3.00 psi , re-adjust after 45 minutes. After 1 hour, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period. The corrected pressure reading shall not be less than 2.94PSI in order for the Test to be acceptable.

- 0.054 PSI for each 1°C of temperature increase

+ 0.054 PSI for each 1°C of temperature decrease

+ 0.049 PSI for each 0.1 inch of barometric increase

- 0.049 PSI for each 0.1 inch of barometric decrease

Chambers	Pressure	5 Min Over P. & Soap Test	45 Minute Stabilizing Period			1 Hour Test								
		Pass / Fail	Design Pressure	Time On	Time Off	Design Pressure	Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass / Fail
Dec 13/04 # 1 (see note 1)	4.36 PSI	Pass	3.00 PSI	12:15	1:00	3.00 PSI	1:00	2:00	2.99 PSI	23° 23°	29.29 29.31	-0.009	2.99 PSI	Pass
Re-Test														
Dec 13/04 Main Seam)	4.36 PSI	Pass	3.00 PSI	1:00	1:45	3.00 PSI	1:45	2:45	3.81 PSI	23° 23°	29.85 29.85	—	3.81 PSI	Pass
Re-Test														

Note 1: Chamber # 1 requires Dart Aerospace Approval Signature: Chr. Dussan

Date: 04/12/15

Observations: OK



**Final Test: Leakage / Relief Valves:** The chambers are to be tested separately (one at a time). Through the Topping Up Valve, inflate chamber to approximately 2.00 PSI, soap the (3) valves to detect leakage. Then slowly inflate chamber until pressure relief valve vents. Use leak detector or non detergent soap to detect the opening and the closing. A hissing sound may also denote that the valve has started to open. Record the opening/closing time and pressure. The opening pressure shall be between 3.3 - 3.5 PSI and the closing pressure shall not be less than 3.00 PSI, in order for the test to be acceptable. After 24 hours, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period (see sheet 2).

The corrected pressure reading shall not be less than 1.60 PSI in order for the Test to be acceptable.

Upon completion of the Final Test, inflate both chambers equally to approx. 2.00 PSI and perform Dimensional Verification below. Perform additional inspection of the tapes and girt assembly.

Pressure Relief Valve Test	PRV Serial Numbers	Opening		Closing		Pass / Fail
		Time ON	Pressure	Time	Close	
Chamber # 1	32852	11:00	3.45 PSI	11:05	3.12 PSI	Pass
Chamber # 2 (Main Seam)	33192	12:10	3.47 PSI	12:15	3.17 PSI	Pass

Chamber # 2 (Main Seam)		33192	18.10	5.17							
24 Hour Leakage Test										Humidity 9 %	
Chambers	Design (closing) Pressure as per above	24 Hour Leakage Test								Pass - Fail	
		Time On	Time Off	Read'g	Temp. Start/End		Barom. Start/End		Adjust.		Final Read'g
Jan 3/05 # 1	3.12 PSI	11:05	11:05	2.73 PSI	24 <sup>c</sup>	24 <sup>c</sup>	30.08	30.12	- +0.019	2.74 PSI	Pass
Re-Test											
Jan 7/05 (Main Seam)	3.17 PSI	12:15	12:15	2.38 PSI	21	23	30.09	30.17	-0.108 +0.039	2.30 PSI	Pass
Re-Test											

Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail
3.5	± 0.100 *	3.5	Pass	47.0	± 0.5	46 1/2	Pass	24.75	± 0.5	25 1/4	Pass
7.3	± 0.100 *	7.3	Pass					31.0	± 0.5	31	Pass

\* = IAW QSI 018, rev. A dated 03-05-29

### Submission of Adhesive Testing:

		Subm.Date / am/pm	Pass/Fail	Subm.Date / am/pm	Pass/Fail	Subm.Date / am/pm	Pass/Fail	Subm.Date / am/pm	Pass/Fail
Peel	24 hour	Dec 2/04	Pass	Dec 7/04	Pass				
	7 day	Dec 2/04	Pass	Dec 7/04	Pass				
Shear	24 hour	Dec 2/04	Pass	Dec 7/04	Pass				
	7 day	Dec 2/04	Pass	Dec 7/04	Pass				



**TULMAR**

#4

**Product Inspection Form # 193-8927(Tube & Final)**

Rev. D Sheet 1-3

**Description: Float Bag Assembly**

-Items are Manufactured IAW Process Control Specification No. 001, 002, 003, 004, 005, 006, and are to be 100% inspected I.A.W. P.I.P. 001

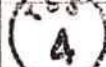

W/O: 3664 TSS P/N: 8927 Qty.: 12 Customer P/N: D3218-041 Dwg. No.: D3218 Rev.: A Date: \_\_\_\_\_

Cutting IAW PCS 003		Marking IAW PCS 004		Bonding IAW PCS 002		Silkscreen	
Operator No.	Date	Operator No.	Date	Operator No.	Date	Operator No.	Date
85	Nov. 30/04	73	Dec 01/04	( Documented below )		73	Nov. 15/04
						73	Dec 15/04

\* Note: PCS 006, there shall be a total of 2 samples submitted for the Testing of the Adhesive (Peel and Shear Test), at start and end of every production day, record on sheet 3/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
1- a) Attach Panel A (uneven edge) to larger edge of Panel B, centered on a 2" inner tape (butt joint) $\pm 1/8"$	379 dec. 04	7104-26 Rejected due to Peel & Shear test * Failures.	1	—	—	1	SS 11	Dec 9/04
b) Attach (6) Valve Flanges on Panel A: 2-Relief, 2-Inlet & 2- Topping Up	110 6/12/04	Bonding * re-inspected & Found Acceptable Dec. 03/04	60	6	—	60	SS 11	Dec 2/04
c) Attach (6) Doublers on above Flanges	#110 6/13/04		60	6	—	60	SS 11	Dec 3/04
2- a) Attach Panel C to Straight edge of Panel A, centered on a 2" inner Tape (butt joint) $\pm 1/8"$	379 dec. 04		1	—	—	1	SS 11	Dec 9/04
3- a) Att. Panel D to Panel B (shorter edge) with 2" inner Tape	379 dec. 04		1	—	—	1	SS 11	Dec 9/04
4- a) Baffle Ass'y. with 2" Tape $\pm 1/8"$	117 13 dec 04	Bonding	1	—	—	1	SS 11	Dec 2/04
5- a) Attach Baffle Ass'y. to Bag ( in 3 stages, minimum )	117 13 dec 04		1	—	—	1	SS 11	Dec 13/04
6- a) Perform Baffle Test on Chamber # 1 after a 3 day Cure Time	12 Dec 20/04	Testing (see sheet 2)	1	—	—	1	SS 11	Dec 20/04
7- a) Closure of 1" Main Seam (overlap) $\pm 1/8"$	117 22 dec 04	Bonding 7104-27	1	—	—	1	SS 11	Dec 22/04
b) Attach ID Patch (ref. CAR 04-003)	37 3 jan. 05		1	—	—	1	SS 11	Jan 5/05
8- a) Perform Baffle Test on Chamber # 2 after a 3 day Cure Time	37 3 jan. 05	Testing (see sheet 2)	1	—	—	1	SS 11	Jan 3/05
9- a) Attach 1" wide Finishing Tape on all Butt Joints & Main Seam, Centered $\pm 1/8"$	37 4 jan. 05	Bonding 7104-27	1	—	—	1	SS 11	Jan 5/05
b) Att. Inspected Girt Ass'y. (Form 193-8927, Girt) to Bag	37 4 jan. 05		1	—	—	1	SS 11	Jan 5/05
c) Attach 5" split patch on each end ( x 4 )	37 4 jan. 05		1	—	—	1	SS 11	Jan 5/05



Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
10- a) Final Test b) Inspector to Stamp on ID Patch: Serial No.: B <b>21829-11</b> & Inspection Stamp beside the S/N	12 Jan 7/05 12 Jan 10/05	Testing (see sheet 3)	1 1	— —	— —	1 1	 	Jan 7/2005 Jan 10/2005

Upon completion of the (final) leakage test, the ID Patch shall be stamped with 5/16 " high lettering and black ink: serial number (7 digits), provided by DART (refer to W/O). \* Verify the integrity of the Valves (Threads/gaskets).

**Test Conditions** – All tests shall be performed in the following conditions:

a) Atmospheric pressure between 28 to 32 inches of mercury (94.8 kPa to 108.4 kPa) b) Temperature shall be  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$  c) Relative humidity shall be 80 % or less

### Baffle Test:

**Over Pressure:** Using socket tool and torque wrench s/n 0801300327, tight all (3) Valves to 40 inch pound, the JIC adaptor s/n 44537 between 15 to 20 foot pounds. Block the Relief valve with flagged pin. Inflate Chamber to 4.36 PSI (30 kPa) with clean dry air source. Using leak detector or non detergent soap, check all the valves and seams to detect leakage. Leakage shall be cause for rejection (soap during testing period). Fuzz is not considered a failure. After 5 minutes, there shall be no evidence of distortion or damage to the seams.

**Inflation Test:** Lower Chamber to 3.00 psi, re-adjust after 45 minutes. After 1 hour, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period. The corrected pressure reading shall not be less than 2.94 PSI in order for the Test to be acceptable.

- 0.054 PSI for each  $1^{\circ}\text{C}$  of temperature increase

+ 0.054 PSI for each  $1^{\circ}\text{C}$  of temperature decrease

+ 0.049 PSI for each 0.1 inch of barometric increase

- 0.049 PSI for each 0.1 inch of barometric decrease

Chambers	Pressure	5 Min. Over P. & Soap Test	45 Minute Stabilizing Period			1 Hour Test										Humid 3 %	
		Pass / Fail	Design Pressure	Time On	Time Off	Design Pressure	Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass / Fail			
# 1 (see note 1)	4.36 PSI	Pass	3.00 PSI	8:50	9:35	3.00 PSI	9:35	10:35	3.0 PSI	23° 23°	29.87 29.88	— -0.004	2.99 PSI	Pass			
Re-Test																	
# 2 (Main Seam)	4.36 PSI	Pass	3.00 PSI	9:00	9:45	3.00 PSI	9:50	10:50	3.0 PSI	24° 24°	30.11 30.11	— —	3.0 PSI	Pass			
Re-Test																	

Note 1: Chamber # 1 requires Dart Aerospace Approval Signature: Chris Provencher

Date: 09/12/21

Observations: Small bubbles in one seam. To be glued. otherwise OK



**Final Test: Leakage / Relief Valves:** The chambers are to be tested separately (one at a time). Through the Topping Up Valve, inflate chamber to approximately 2.00 PSI, soap the (3) valves to detect leakage. Then slowly inflate chamber until pressure relief valve vents. Use leak detector or non detergent soap to detect the opening and the closing. A hissing sound may also denote that the valve has started to open. Record the opening/closing time and pressure. The opening pressure shall be between 3.3 - 3.5 PSI and the closing pressure shall not be less than 3.00 PSI, in order for the test to be acceptable. After 24 hours, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period (see sheet 2).

The corrected pressure reading shall not be less than 1.60 PSI in order for the Test to be acceptable.

Upon completion of the Final Test, inflate both chambers equally to approx. 2.00 PSI and perform Dimensional Verification below. Perform additional inspection of the tapes and girt assembly.

Pressure Relief Valve Test	PRV Serial Numbers	Opening		Closing		Pass / Fail
		Time ON	Pressure	Time	Close	
Chamber # 1	33202	9:10	3.49 PSI	9:15	3.11 PSI	Pass
Chamber # 2 (Main Seam)	33195	11:25	3.50 PSI	11:30	3.22 PSI	Pass

Jan 5/05 Chambers	Design (closing) Pressure as per above	24 Hour Leakage Test								Rushy 11%		
		Time On	Time Off	Read'g	Temp. Start/End		Barom. Start/End		Adjust.	Final Read'g	Pass	Fail
# 1	3.11 PSI	9:15	9:15	2.71 PSI	22°	22°	30.20	29.91	-0.142	2.57 PSI	Pass	
Re-Test												
Jan 6/05 #2 (Main Seam)	3.22 PSI	11:30	11:30	2.16 PSI	22°	22°	29.79	30.05	+0.147	2.30 PSI	Pass	
Re-Test												

Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail
3.5	± 0.100 *	3.5	Pass	47.0	± 0.5	46.78	Pass	24.75	± 0.5	25	Pass
7.3	± 0.100 *	7.25	Pass					31.0	± 0.5	31 3/8	Pass

\* = IAW QSI 018, rev. A dated 03-05-29

4

### Submission of Adhesive Testing:

		Subm. Date / am- <del>pm</del>	Pass/Fail	Subm. Date / am- <del>pm</del>	Pass/Fail	Subm. Date / am- <del>pm</del>	Pass/Fail	Subm. Date / am- <del>pm</del>	Pass/Fail
Peel	24 hour	Dec 2/04	Failed	Dec 9/04	Pass	Dec 13/04	Pass	Dec 22/04	Pass
	7 day	Dec 2/04	Failed	Dec 9/04	Pass	Dec 13/04	Pass	Dec 22/04	Pass
Shear	24 hour	Dec 2/04	Failed	Dec 9/04	Pass	Dec 13/04	Pass	Dec 22/04	Pass
	7 day	Dec 2/04	Failed	Dec 9/04	Pass	Dec 13/04	Pass	Dec 22/04	Pass

Note 1 Bag #4 all work is in tubes about 4 inches



**TULMAR****Product Inspection Form # 193-8927(Tube & Final)**

Rev. D Sheet 1 of 3

#8

**Description:** Float Bag Assembly

-Items are Manufactured IAW Process Control Specification No. 001, 002, 003, 004, 005, 006, and are to be 100% inspected I.A.W. P.I.P. 001

W/O: 3664 TSS P/N: 8927 Qty.: 1 Customer P/N: D3218-041 Dwg. No.: D3218 Rev.: A Date: \_\_\_\_\_

Cutting IAW PCS 003		Marking IAW PCS 004		Bonding IAW PCS 002		Silkscreen	
Operator No.	Date	Operator No.	Date	Operator No.	Date	Operator No.	Date
85	Nov. 30/04	73	Dec 01/04	( Documented below )		73	Nov. 15/04
						73	Dec 15/04

\* Note: PCS 006, there shall be a total of 2 samples submitted for the Testing of the Adhesive (Peel and Shear Test), at start and end of every production day, record on sheet 3/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
1- a) Attach Panel A (uneven edge) to larger edge of Panel B, centered on a 2" inner tape (butt joint) $\pm 1/8"$ b) Attach (6) Valve Flanges on Panel A: 2-Relief, 2-Inlet & 2- Topping Up c) Attach (6) Doublers on above Flanges	37 8 dec. 04 #110 12/12/04	7104-26  Bonding	1 680 6	- -6 -	- - -	1 680 6		Dec 8/04 Dec 7/04 Dec 7/04
2- a) Attach Panel C to Straight edge of Panel A, centered on a 2" inner Tape (butt joint) $\pm 1/8"$	37 8 dec. 04	7104-26	1	-	-	1		Dec 8/04
3- a) Att. Panel D to Panel B (shorter edge) with 2" inner Tape	37 8 dec. 04	7104-26	1	-	-	1		Dec 8/04
4- a) Baffle Ass'y. with 2" Tape $\pm 1/8"$	117 9 dec. 04	Bonding	1	-	-	1		Dec 9/04
5- a) Attach Baffle Ass'y. to Bag ( in 3 stages, minimum )	117 10 dec. 04		1	-	-	1		Dec 10/04
6- a) Perform Baffle Test on Chamber # 1 after a 3 day Cure Time	12 13 dec 2004	Testing (see sheet 2)	1	-	-	1		Dec 13/04
7- a) Closure of 1" Main Seam (overlap) $\pm 1/8"$ b) Attach ID Patch (ref. CAR 04-003)	117 15 dec 04 37 3 jan. 04	Bonding 7104-27	1 1	- -	- -	1 1		Dec 16/04 Jan 5/05
8- a) Perform Baffle Test on Chamber # 2 after a 3 day Cure Time	12 22/dec 04	Testing (see sheet 2)	1	-	-	1		Dec 22/04
9- a) Attach 1" wide Finishing Tape on all Butt Joints & Main Seam, Centered $\pm 1/8"$ b) Att. Inspected Girt Ass'y. (Form 193-8927, Girt) to Bag c) Attach 5" split patch on each end ( x 4 )	37 4 jan. 04 4 jan. 04 37 4 jan. 04	7104-27 Bonding 7104-27 7104-27	1 1 1	- - -	- - -	1 1 1		Jan 5/05 Jan 5/05 Jan 5/05



TULMAR #8

## Product Inspection Form # 193-8927(Tube &amp; Final)

Rev. D Sheet 2/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
10- a) Final Test b) Inspector to Stamp on ID Patch: Serial No.: B <b>21829-12</b> & Inspection Stamp beside the S/P	12 Jan 7/05	Testing (see sheet 3)	1	—	—	1		Jan 7 2005

Upon completion of the (final) leakage test, the ID Patch shall be stamped with 5/16" high lettering and black ink: serial number (7 digit(s), provided by DART (refer to W/O). \* Verify the integrity of the Valves (Threads/gaskets).

**Test Conditions** – All tests shall be performed in the following conditions:

a) Atmospheric pressure between 28 to 32 inches of mercury (94.8 kPa to 108.4 kPa) b) Temperature shall be 20°C ± 5°C c) Relative humidity shall be 80 % or less

**Baffle Test:**

**Over Pressure:** Using socket tool and torque wrench s/n 0801300327, tight all (3) Valves to 40 inch pound, the JIC adaptor s/n 44537 between 15 to 20 foot pounds. Block the Relief valve with flagged pin. Inflate Chamber to 4.36 PSI (30 kPa) with clean dry air source. Using leak detector or non detergent soap, check all the valves and seams to detect leakage. Leakage shall be cause for rejection (soap during testing period). Fuzz is not considered a failure. After 5 minutes, there shall be no evidence of distortion or damage to the seams.

**Inflation Test:** Lower Chamber to 3.00 psi, re-adjust after 45 minutes. After 1 hour, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period. The corrected pressure reading shall not be less than 2.94 PSI in order for the Test to be acceptable.

- 0.054 PSI for each 1°C of temperature increase

+ 0.054 PSI for each 1°C of temperature decrease

+ 0.049 PSI for each 0.1 inch of barometric increase

- 0.049 PSI for each 0.1 inch of barometric decrease

Chambers	Pressure	5 Min. Over P. & Soap Test	45 Minute Stabilizing Period			1 Hour Test									Humidity 13%	
		Pass / Fail	Design Pressure	Time On	Time Off	Design Pressure	Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass / Fail		
DEC 13/04																
# 1 (see note 1)	4.36 PSI	Pass	3.00 PSI	12:15	1:00	3.00 PSI	1:00	2:00	2.99 PSI	23° 23°	29.29 29.31	+0.009	2.99 PSI	Pass		
Re-Test																
DEC 22/04 Main Seam)	4.36 PSI	Pass	3.00 PSI	1:35	2:20	3.00 PSI	2:20	3:20	3.00 PSI	23° 23°	29.29 29.23	-0.009	2.97 PSI	Pass		
Re-Test																

Note 1: Chamber # 1 requires Dart Aerospace Approval Signature: Chris Provencal

Date: 09.12.15

Observations: OK



**Final Test: Leakage / Relief Valves:** The chambers are to be tested separately (one at a time). Through the Topping Up Valve, inflate chamber to approximately 2.00 PSI, soap the (3) valves to detect leakage. Then slowly inflate chamber until pressure relief valve vents. Use leak detector or non detergent soap to detect the opening and the closing. A hissing sound may also denote that the valve has started to open. Record the opening/closing time and pressure. The opening pressure shall be between 3.3 - 3.5 PSI and the closing pressure shall not be less than 3.00 PSI, in order for the test to be acceptable. After 24 hours, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period (see sheet 2).

The corrected pressure reading shall not be less than 1.60 PSI in order for the Test to be acceptable.

Upon completion of the Final Test, inflate both chambers equally to approx. 2.00 PSI and perform Dimensional Verification below. Perform additional inspection of the tapes and girt assembly.

Pressure Relief Valve Test	PRV Serial Numbers	Opening		Closing		Pass / Fail
		Time ON	Pressure	Time	Close	
Chamber # 1	33185	12:15	3.50 PSI	12:20	3.27 PSI	Pass
Chamber # 2 (Main Seam)		12:25	3.50 PSI	12:30	3.25 PSI	Pass

on 5/05 Chambers	Design (closing) Pressure as per above	24 Hour Leakage Test								Pass / Fail	
		Time On	Time Off	Read'g	Temp. Start/End		Barom. Start/End		Adjust.		Final Read'g
# 1	3.27 PSI	12:20	12:20	2.82 PSI	23°	22°	30.15	29.71	+0.054 -0.215	2.65 PSI	Pass
Re-Test											
# 2 (Main Seam)	3.25 PSI	12:30	12:30	2.29 PSI	22	23	29.69	30.04	+0.054 +0.1715	2.40 PSI	Pass
Re-Test											

Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail
3.5	± 0.100 *	3.4	Pass	47.0	± 0.5	46.5/8	Pass	24.75	± 0.5	25 1/8	Pass
7.3	± 0.100 *	7.2	Pass					31.0	± 0.5	31 3/8	Pass

\* = IAW QSI 018, rev. A dated 03-05-29

### Submission of Adhesive Testing:

		Subm. Date / am-pm	Pass/Fail	Subm. Date / am-pm	Pass/Fail	Subm. Date / am-pm	Pass/Fail	Subm. Date / am-pm	Pass/Fail
Peel	24 hour	Dec 2/04	Failed	Dec 8/04	Pass	Dec 10/04	Pass	Jan 4/05	Pass
	7 day	Dec 2/04	Failed	Dec 8/04	Pass	Dec 10/04	Pass	Jan 4/05	Pass
Shear	24 hour	Dec 2/04	Failed	Dec 8/04	Pass	Dec 10/04	Pass	Jan 4/05	Pass
	7 day	Dec 2/04	Failed	Dec 8/04	Pass	Dec 10/04	Pass	Jan 4/05	Pass

Note: Rec #8 all work was taken care of



# TULMAR

## Product Inspection Form # 193-8927(Tube & Final)

Rev. D Sheet 1/3

#11










Description: Float Bag Assembly

-Items are Manufactured IAW Process Control Specification No. 001, 002, 003, 004, 005, 006, and are to be 100% inspected I.A.W. P.I.P. 001



W/O: 3664 TSS P/N: 8927 Qty.: 12 Customer P/N: D3218-041 Dwg. No.: D3218 Rev.: A Date: \_\_\_\_\_

Cutting IAW PCS 003		Marking IAW PCS 004		Bonding IAW PCS 002		Silkscreen	
Operator No.	Date	Operator No.	Date	Operator No.	Date	Operator No.	Date
85	Nov. 30/04	73	Dec 01/04	( Documented below )		73	Nov. 15/04
						73	Dec 15/04

\* Note: PCS 006, there shall be a total of 2 samples submitted for the Testing of the Adhesive (Peel and Shear Test), at start and end of every production day, record on sheet 3/3

Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
1- a) Attach Panel A (uneven edge) to larger edge of Panel B, centered on a 2" inner tape (butt joint) $\pm 1/8"$ b) Attach (6) Valve Flanges on Panel A: 2-Relief, 2-Inlet & 2- Topping Up c) Attach (6) Doublers on above Flanges	37 6dec.04 #110 6/12/04	7104-25-26 Bonding	1 6 5	— 6 190	— — —	1 6 6		Dec 7/04 > Dec/0401
2- a) Attach Panel C to Straight edge of Panel A, centered on a 2" inner Tape (butt joint) $\pm 1/8"$	37 7dec.04	7104-26	1	—	—	1		Dec 7/04
3- a) Att. Panel D to Panel B (shorter edge) with 2" inner Tape	37 7dec.04	7104-26	1	—	—	1		Dec 7/04
4- a) Baffle Ass'y. with 2" Tape $\pm 1/8"$	117 7dec04	Bonding	1	—	—	1		Dec 7/04
5- a) Attach Baffle Ass'y. to Bag ( in 3 stages, minimum )	117 9 dec04		1	—	—	1		Dec 9/04
6- a) Perform Baffle Test on Chamber # 1 after a 3 day Cure Time	12 14dec04	Testing (see sheet 2)	1	—	—	1		Dec 14/04
7- a) Closure of 1" Main Seam (overlap) $\pm 1/8"$ b) Attach ID Patch (ref. CAR 04-003)	117 15dec04 37 3 jan. 05	Bonding 7104-27	1 1	— —	— —	1 1		Dec 16/04 Jan 5/05
8- a) Perform Baffle Test on Chamber # 2 after a 3 day Cure Time	12 22dec 2004	Testing (see sheet 2)	1	—	—	1		Dec 22/04
9- a) Attach 1" wide Finishing Tape on all Butt Joints & Main Seam, Centered $\pm 1/8"$ b) Att. Inspected Girt Ass'y. (Form 193-8927, Girt) to Bag c) Attach 5" split patch on each end ( x 4 )	37 3 jan. 05 37 4 jan. 05	Bonding 7104-27	1 1	— —	— —	1 1		Jan 5/05 Jan 5/05 Jan 5/05



Stages & Descriptions	Operator No. + Date	Operation	Accept. Qty.	Reject. Qty.	NCR	Total Accept.	Insp. Stamp	Date
10- a) Final Test b) Inspector to Stamp on ID Patch: Serial No.: B <b>21829-10</b> & Inspection Stamp beside the S/N	12 Jan 7/05  12 Jan 10/05	Testing (see sheet 3)	1  1	—  —	—  —	1  1	 	Jan 7/05  Jan 10/05

Upon completion of the (final) leakage test, the ID Patch shall be stamped with 5/16" high lettering and black ink: serial number (7 digits), provided by DART (refer to W/O). \* Verify the integrity of the Valves (Threads/gaskets).

**Test Conditions** – All tests shall be performed in the following conditions:

a) Atmospheric pressure between 28 to 32 inches of mercury (94.8 kPa to 108.4 kPa) b) Temperature shall be  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$  c) Relative humidity shall be 80 % or less

### Baffle Test:

**Over Pressure:** Using socket tool and torque wrench s/n 0801300327, tight all (3) Valves to 40 inch pound, the JIC adaptor s/n 44537 between 15 to 20 foot pounds. Block the Relief valve with flagged pin. Inflate Chamber to 4.36 PSI (30 kPa) with clean dry air source. Using leak detector or non detergent soap, check all the valves and seams to detect leakage. Leakage shall be cause for rejection (soap during testing period). Fuzz is not considered a failure. After 5 minutes, there shall be no evidence of distortion or damage to the seams.

**Inflation Test:** Lower Chamber to 3.00 psi, re-adjust after 45 minutes. After 1 hour, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period. The corrected pressure reading shall not be less than 2.94 PSI in order for the Test to be acceptable.

- 0.054 PSI for each  $1^{\circ}\text{C}$  of temperature increase  
+ 0.049 PSI for each 0.1 inch of barometric increase

+ 0.054 PSI for each  $1^{\circ}\text{C}$  of temperature decrease

- 0.049 PSI for each 0.1 inch of barometric decrease

DEC 14 2004	Chambers	Pressure	5 Min. Over P. & Soap Test	45 Minute Stabilizing Period			1 Hour Test									Humidity 8%	
Pass / Fail			Design Pressure	Time On	Time Off	Design Pressure	Time On	Time Off	Read'g	Temp. Start/End	Barom. Start/End	Adjust.	Final Read'g	Pass / Fail			
# 1 (see note 1)	4.36 PSI	Pass	3.00 PSI	10:40	11:20	3.00 PSI	11:20	12:20	3.00 PSI	23° 23°	29.92 29.91	-0.004	2.99 PSI	Pass			
Re-Test																	
DEC 14 2004 # 2 (Main Seam)	4.36 PSI	Pass	3.00 PSI	1:30	2:15	3.00 PSI	2:15	3:15	3.00 PSI	23° 23°	29.29 29.23	-0.009	2.97 PSI	Pass			
Re-Test																	

Note 1: Chamber # 1 requires Dart Aerospace Approval Signature: Chris Panamas

Date: 04.12.15

Observations: OK



**Final Test: Leakage / Relief Valves:** The chambers are to be tested separately (one at a time). Through the Topping Up Valve, inflate chamber to approximately 2.00 PSI, soap the (3) valves to detect leakage. Then slowly inflate chamber until pressure relief valve vents. Use leak detector or non detergent soap to detect the opening and the closing. A hissing sound may also denote that the valve has started to open. Record the opening/closing time and pressure. The opening pressure shall be between 3.3 – 3.5 PSI and the closing pressure shall not be less than 3.00 PSI, in order for the test to be acceptable. After 24 hours, take the pressure reading of the chamber. Compensate the pressure reading by allowing for any temperature and barometric pressure changes during the test period (see sheet 2).

The corrected pressure reading shall not be less than 1.60 PSI in order for the Test to be acceptable.

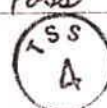
Upon completion of the Final Test, inflate both chambers equally to approx. 2.00 PSI and perform Dimensional Verification below. Perform additional inspection of the tapes and girt assembly.

Pressure Relief Valve Test	PRV Serial Numbers	Opening		Closing		Pass / Fail
		Time ON	Pressure	Time	Close	
Chamber # 1	33191	9:15	3.20 PSI	9:20	3.01 PSI	Pass
Chamber # 2 (Main Seam)	33194	11:30	3.50 PSI	11:35	3.13 PSI	Pass

Chambers	Design (closing) Pressure as per above	24 Hour Leakage Test								Final Read'g	Pass Fail
		Time On	Time Off	Read'g	Temp. Start/End		Barom. Start/End		Adjust.		
Jan 5/05 #1	3.01 PSI	9:20	9:20	2.64 PSI	22 <sup>c</sup>	22 <sup>c</sup>	30:20	29.91	-0.142	2.50 PSI	Pass
Re-Test											
Jan 6/05 #2 (Main Seam)	3.13 PSI	11:35	11:35	2.35 PSI	22 <sup>c</sup>	22 <sup>c</sup>	29.79	30.05	+0.147	2.49 PSI	Pass
Re-Test											

Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail	Dim.	Tol.	Actual Dim.	Pass/Fail
3.5	± 0.100 *	3.4	Pass	47.0	± 0.5	46.50	Pass	24.75	± 0.5	25 1/16	Pass
7.3	± 0.100 *	7.4	Pass					31.0	± 0.5	31 1/8	Pass

\* = IAW QSI 018, rev. A dated 03-05-29



### Submission of Adhesive Testing:

		Subm. Date / am-pm	Pass/Fail	Subm. Date / am-pm	Pass/Fail	Subm. Date / am-pm	Pass/Fail	Subm. Date / am-pm	Pass/Fail
Peel	24 hour	Dec 7/04	Pass	Dec 15/04	Pass				
	7 day	Dec 7/04	Pass	Dec 15/04	Pass				
Shear	24 hour	Dec 7/04	Pass	Dec 15/04	Pass				
	7 day	Dec 7/04	Pass	Dec 15/04	Pass				